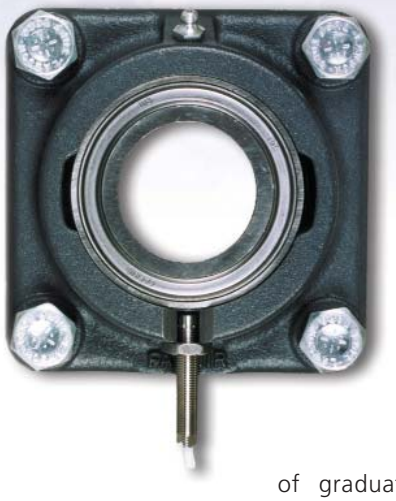
Independent Study Shows REBAM® Technology Superior to Casing Measurements

Laboratory test results on REBAM® technology, comparing it to casing-mounted accelerometers for a variety of rolling element bearing defects, was presented by Dr. Al-Bedoor of the mechanical engineering department at Saudi Arabia's King Fahd University of Petroleum & Minerals (KFUPM) in the "Condition Monitoring and Condition-Based Maintenance" workshop held at the university on 3 April 2001. The laboratory tests were part of an independent study that involved, in addition to Dr. Al-Bedoor, a number of graduate and undergraduate students. Here are some excerpts directly from the presentation:



"REBAM® transducers gave more reliable results for identifying the outer race defect, as indicated by direct increase in the outer race pass frequency component. The accelerometer in this study gave misleading results that can be referred to the excitation of the support."

"REBAM identified the inner race defect as the inner race pass frequency component appeared exactly at the theoretically calculated frequency for the inner race defected bearing. No inner race frequency component has appeared for the healthy bearing nor for the bearing with outer race defects. This shows that REBAM is sensitive to the inner race defect even if it is monitoring the outer race. The accelerometer gave similar sensitivity to the inner race problem, but the inner race frequency, when it appeared for the bearing with an inner race defect, was present with many other frequencies with the same amplitude."

"Finally, and based completely on the results of this study, one can conclude that REBAM is powerful in identifying defective bearing components as it gives directly the bearing component's frequency and amplitude which is sensitive to the particular component defect. Its frequency spectrum is very representative of the calculated bearing frequencies due to its method of mounting, which results in monitoring the relative motion between the bearing outer race and the bearing support; it is insensitive to support vibrations and rotor foundation structural resonances. This feature, with REBAM's demonstrated high sensitivity and ability to catch even the far inner race defect, makes it very suitable for monitoring rolling element bearing problems."

Bently Nevada has long advocated REBAM® technology as a superior way to monitor rolling element bearings, particularly for critical applications such as the following, where better diagnostic capabilities and earlier warning of failure is vital:

- Aeroderivative gas turbines.
- Slow-speed, heavily loaded applications such as extruders. Seismic transducers are not appropriate for such applications due to their limited frequency response. REBAM transducers have a frequency response that extends to 0 Hz and directly observe the source of vibration (the bearing).
- Auto-shutdown machinery protection applications. The increased integrity of the REBAM measurement, as well as the self-checking capabilities inherent in a proximity probe system, create a very reliable measurement system, far less prone to false or missed trips than with a seismic measurement.
- Machines where casing movement is unrelated to machine condition, such as wind turbines.

We are delighted that independent tests of our technology support our own conclusions and tests regarding the superiority of REBAM measurements. More comprehensive testing on REBAM is still underway by Dr. Al-Bedoor. ORBIT